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**THIS PATENT APPLICATION IS BEING**  
**FILED WITH SMALL ENTITY STATUS**

## **AUXILIARY WHEEL RIM**

### **BACKGROUND OF THE INVENTION**

#### **1. Field of the Invention:**

The present invention relates to vehicle tires and, more  
5 particularly, to an auxiliary wheel rim for use in a vehicle tire.

#### **2. Description of the Related Art:**

Conventional vehicle tires include two types, namely, the  
one with inner tube and the other without inner tube. A tire with an  
inner tube is inflatable. When the inner tube of a tire pierced by a  
10 pointed external object, it leaks, and the driver must stop the car  
immediately. A sudden explosion of a tire may cause a traffic  
accident when the car is running on a freeway. A tubeless tire or the  
so-called high-speed tire does not explode when pierced by a  
pointed external object, giving a sufficient time to let the driver  
15 drive the car to a garage for repair. However, because no  
significant tire pressure loss is shown when one tire of the car was  
pierced by a pointed external object, the driver may keep driving  
the car on a highway or freeway. In this case, an accident may  
occur.

20 Therefore, it is desirable to provide an auxiliary wheel rim  
for a vehicle wheel that eliminates the aforesaid problems.

### **SUMMARY OF THE INVENTION**

The present invention has been accomplished under the

circumstances in view. It is the main object of the present invention to provide an auxiliary wheel rim, which allows the car driver to keep driving the car safely for a certain period of time upon an explosion of the tire. It is another object of the present invention to  
5 provide an auxiliary wheel rim, which is easy to install. It is still another object of the present invention to provide an auxiliary wheel rim, which fits tires of different sizes.

To achieve these and other objects of the present invention, the auxiliary wheel rim comprises a plurality of first rim elements,  
10 the first rim elements each comprising a top wall fitting the curvature of the wheel rim of a vehicle wheel, a smoothly arched bottom wall reinforced with at least one reinforcing rib, a middle support connected between the top wall and bottom wall of the respective first rim element on the middle, and two end supports  
15 connected between the top wall and bottom wall of the respective first rim element at two distal ends, the end supports of the first rim element each having two outwardly protruding lugs; a second rim element, the second rim element comprising a top wall fitting the curvature of the wheel rim of a vehicle tire, a smoothly arched  
20 bottom wall reinforced with at least one reinforcing rib, a middle support connected between the top wall and bottom wall of the second rim element on the middle, a first end support connected between the top wall and bottom wall of the second rim element at

one end, a second end support connected between the top wall and bottom wall of the second rim element at an opposite end, the first end support of the second rim element having two outwardly protruding lugs, the second end support of the second rim element  
5 having a countersunk screw hole and a tool hole; a third rim element, the third rim element comprising a top wall fitting the curvature of the wheel rim of a vehicle tire, a smoothly arched bottom wall reinforced with at least one reinforcing rib, a middle support connected between the top wall and bottom wall of the  
10 third rim element on the middle, a first end support connected between the top wall and bottom wall of the third rim element at one end, a second end support connected between the top wall and bottom wall of the third rim element at an opposite end, the first end support of the third rim element having two outwardly  
15 protruding lugs, the second end support of the third rim element having a countersunk screw hole and a tool hole respectively disposed corresponding to the countersunk screw hole and tool hole of the second rim element, and two flanges disposed at two opposite lateral sides and adapted to support the second end  
20 support of the second rim element on the second end support of the third rim element; a plurality of links respectively fastened to the lugs of the first rim elements and the lugs of the second rim element and the lugs of the third rim element with pins to connect

the first rim elements in series between the second rim element and the third rim element; and a screw bolt fastened to the countersunk screw hole of the second end support of the second rim element and the countersunk screw hole of the second end support of the third rim element to secure the second end support of the second rim element to the second end support of the third rim element.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a sectional view showing an auxiliary wheel rim installed in a vehicle inside the tire.

FIG. 2 is an exploded view of a part of an auxiliary wheel rim according to the present invention.

FIG. 3 is another sectional view of the vehicle wheel shown in FIG. 1.

FIG. 4 is a schematic drawing showing the connection between the second end support of the second rim element and the second end support of the third rim element during installation of the present invention.

FIG. 5 is a schematic drawing showing the supporting status of the exploded tire on the auxiliary wheel rim according to the present invention.

### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to FIG. 1, an auxiliary wheel rim 2000 is shown comprised of a plurality of first rim elements 10, a second rim

element **50**, a third rim element **60**, a screw bolt **72**, a plurality of links **70**, and a plurality of pins **71**. The screw bolt **72** has a polygonal shoulder **72a**.

Each first rim element **10** comprises a top wall **101** fitting  
5 the curvature of the wheel rim **1000**, a smoothly arched bottom wall **30**, a middle support **20** connected between the top wall **101** and the bottom wall **30** on the middle, and two end supports **40** connected between the top wall **101** and the bottom wall **30** at two distal ends. The bottom wall **30** has a reinforcing rib **301** extended along the  
10 length and formed integral with the middle support **20** and the end supports **40**. The end supports **40** each have two outwardly protruding lugs **40a**.

The second rim element **50** comprises a top wall **101** fitting the curvature of the wheel rim **1000**, a smoothly arched bottom wall  
15 **30**, a middle support **20** connected between the top wall **101** and the bottom wall **30** on the middle, a first end support **40** connected between the top wall **101** and the bottom wall **30** at one end, a second end support **401** connected between the top wall **101** and the bottom wall **30** at the other end. The bottom wall **30** has a  
20 reinforcing rib **301** extended along the length and formed integral with the middle support **20** and the first end support **40**, and the second end support **401**. The first end support **40** has two outwardly protruding lugs **40a**. The second end support **401** has a countersunk

screw hole **402** and a through hole **403**.

The third rim element **60** comprises a top wall **101** fitting the curvature of the wheel rim **1000**, a smoothly arched bottom wall **30**, a middle support **20** connected between the top wall **101** and the bottom wall **30** on the middle, a first end support **40** connected between the top wall **101** and the bottom wall **30** at one end, a second end support **404** connected between the top wall **101** and the bottom wall **30** at the other end. The bottom wall **30** has a reinforcing rib **301** extended along the length and formed integral with the middle support **20** and the first end support **40**, and the second end support **404**. The first end support **40** has two outwardly protruding lugs **40a**. The second end support **404** has a countersunk screw hole **405**, a through hole **406**, and two flanges **407** disposed at two opposite lateral sides. Further, in order to diminish material consumption and the weight, the top walls **101** of the first rim elements **10**, second rim element **50** and third rim element **60** are made having through holes. Additional reinforcing ribs may be made on the bottom walls **30** of the first rim elements **10**, second rim element **50** and third rim element **60** to reinforce the structural strength.

Referring also to FIGS. 3~5, the links **70** are respectively fastened to the lugs **40a** by the pins **71** to connect the first rim elements **10**, the second rim element **50** and the third rim element

60 in series, and then the second end support 401 of the second rim element 50 and the second end support 404 of the third rim element 60 are attached together, forming with the first rim elements 10 the desired annular auxiliary wheel rim 2000. The auxiliary wheel rim 2000 thus obtained is then inserted into the inside of a tire 1100, and then the tire 1100 with the auxiliary wheel rim 2000 are attached to the wheel rim 1000. During installation, one side of the tire 1100 is covered on the wheel rim 1000, and then insert two magnets 500 into the through holes 403 and 406 of the second end supports 401 and 404 to secure the second end supports 401 and 404 together, and then fasten the screw bolt 72 to the countersunk screw holes 402 and 405 to firmly secure the two second end supports 401 and 404 together, keeping the second end support 401 of the second rim element 50 stopped between the flanges 407 of the second end support 404 of the third rim element 60. After removal of the magnets 500, the other side of the tire 1100 is covered on the wheel rim 1000, finishing the installation.

If the tire leaks during running, the auxiliary wheel rim 2000 supports the wheel in functioning, enabling the driver to drive the car to a repair shop safely for further repair.

A prototype of auxiliary wheel rim has been constructed with the features of FIGS. 1~5. The auxiliary wheel rim functions smoothly to provide all of the features discussed earlier.

Although a particular embodiment of the invention has been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the invention. Accordingly, the  
5 invention is not to be limited except as by the appended claims.